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SUBJECT INDEX

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Editorial material in this section is classified according to the following system:

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1. Title.				
2. Author's last name (see Author Index for complete name). Departments in regular issues are denoted by the following code:				
Trends Trends in Technology				
or Trends in Design & Development				
Scan Scanning the Field for Ideas				
DIA Design in Action				
3. Date of issue. MACHINE DESIGN <i>Reference Issues</i> are denoted by the following code:				
F Fasteners (March 11)				
MD Mechanical Drives (June 17)				
M Metals (September 9)				
EM Electric Motors (December 16)				
4. Page Number.				
5. Number of pages in article or editorial item.				

Electrical and Electronic Drives, Controls and Systems

11. Electric Motors

400-cps Motors	Varner	7/8	120	(5.0)
Clutch-Brake Motors	Bowers	8/19	152	(5.0)
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Insulation and Temperature Rise	Bradbury	EM 12/16	9	(3.0)
Motor Protection	Campbell	EM 12/16	26	(6.0)
Fractional-Horsepower Induction Motors	Campbell	EM 12/16	32	(7.0)
Integral-Horsepower Induction Motors	Lamkey	EM 12/16	39	(11.0)
Multispeed Motors	Gregory	EM 12/16	50	(3.0)
Synchronous Motors	Oscarson	EM 12/16	53	(5.0)
Fractional-Horsepower D-C Motors	Porter	EM 12/16	58	(2.0)
Integral-Horsepower D-C Motors	Davis	EM 12/16	60	(5.0)
Universal Motors	Sebok & Easton	EM 12/16	65	(5.0)
Definite-Purpose Motors	Axthelm	EM 12/16	70	(4.5)
Special-Purpose Motors	Schreiber	EM 12/16	74	(3.5)
Fractional-Horsepower Gearmotors	Tennerstedt	EM 12/16	78	(3.3)
Integral-Horsepower Gearmotors	Burnett	EM 12/16	81	(4.7)
Clutch and Brake Motors	Siegel & Bowers	EM 12/16	86	(5.0)
Torque Motors	Pop & Hughes	EM 12/16	91	(3.0)
Instrument Motors	Matthews	EM 12/16	98	(4.0)
Miniaturized Mammoth Motors	Trends	2/18	189	(0.5)
Surrounding Flux Supplies Rotor Kick	Scan	4/1	116	(0.5)

12. Power Supplies

Uninterrupted-Power Supplies	Callaghan	4/29	228	(5.0)
Economical 5-kw Fuel Cell Bids for Field Work	Trends	2/4	14	(0.7)
Wrinkled Panel Doubles Efficiency of Solar-Cell Systems	Trends	7/22	12	(0.6)
New Order of On/Off Ratios for Magnetoresistors	Trends	9/16	191	(0.6)
Satellite Bake Oven Repairs Damaged Solar Cells	Trends	11/25	12	(0.7)
One Rotor Does All the Work in New Frequency Generator	Trends	12/9	181	(0.6)
Explosive Primes Dry-Charge Battery	DIA	2/18	24	(1.0)
Photocell Clamp Monitors Blood's Oxygen Content	DIA	3/18	24	(1.0)
Electronic Eye Watches for Nuclear Blasts	DIA	4/1	34	(0.5)
Battery "Eye" Warns of Low Fluid	DIA	10/18	32	(0.5)

13. Switches & Relays

Reed Switches	Mayor	9/2	150	(3.9)
Opto-Electronic Relays	McMahon & Hudson	9/30	142	(4.8)
Static A-C Power Switches	Gutzwiller	10/14	190	(7.0)
D-C Motor Controls	Ponstingl	EM 12/16	19	(7.0)
A-C Motor Controls	Wickey	EM 12/16	12	(7.0)
Limit Switch Offers Direct Fluidic Control	Trends	11/11	222	(0.5)
Meltable Button Actuates Instant Battery Engineer Pumps Pedal to Prove He's Healthy	Scan	8/19	158	(0.6)
Fast Acting Relays Stop Trailer-Train Jackknifing	DIA	3/18	32	(0.5)
	DIA	10/14	34	(1.0)

14. Instruments & Controls

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Semiconductor Sensors	Lujic	7/22	149	(6.0)
Closed-Loop Stepping Motor	Fredrikson	9/16	202	(4.4)
Servomotors	Mea	EM 12/16	94	(4.0)
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Dual Photocells Read Both Torque and Speed	Scan	2/4	113	(0.6)
Dual Sine Pulses Measure Displacement	Scan	2/4	114	(1.0)
Hall Generators Measure Angular Position	Scan	4/29	216	(0.5)
Bubble Forms Movable Aperture	Scan	7/22	145	(1.0)
Roller Speeds Indicate Strip Flatness	Scan	8/19	159	(1.0)
Bimetallic Belleville Snaps Itself	Scan	10/28	151	(0.5)
Seawater Voltage Tells Submarine Speed	DIA	2/18	28	(1.0)
Antenna Probe Monitors Bulk-Handling				

Systems	DIA	4/15	45	(0.5)
Thermocouples Trigger Damp-Gas Detector	DIA	4/29	42	(0.6)
Sensor Sees Only Molten Metal	DIA	8/5	32	(0.5)
Machine-Tool Control Card Programmed with Plier	DIA	8/19	34	(1.0)
Pilot Watches Window for Flight Instructions	DIA	11/25	28	(1.0)

15. Circuit Components

Semiconductor Diodes for Power Rectification	Zastrow	2/18	191	(8.0)
Low-Cost SCRs Promise Infinite Control in the Kitchen	Trends	8/5	153	(1.0)
Wescon Gives Five Design Awards	Trends	9/2	23	(2.0)
Laser Progress Reported on Three Fronts	Trends	12/9	184	(0.5)
Transit-Time Devices: A New Kind of Component	Trends	12/9	184	(0.5)
IR-Aimed Laser Radar Makes Ready for War	Trends	12/23	10	(0.6)
Cylindrical Capacitor Indicates Fluid Density	Scan	12/9	153	(1.0)
Mercury Column Forms Pneumatically Controlled Rheostat	Scan	12/9	154	(0.5)
Laser Metrology System Checks Machine-Tool Scales	DIA	12/9	29	(1.0)

16, 17. Connectors, Wiring, General Components

Thermoelectric Cooling	Lefferts	1/7	118	(6.0)
Electroluminescence	Strock & Greenberg	2/18	206	(5.0)
Floating Commuter Cars Ride Magnetic Highway	Trends	2/18	12	(0.5)
New Plugs and Receptacles Prevent Shocking Errors	Trends	7/8	148	(1.3)
Heated Bimetallies Perform Dual Control	Scan	2/18	173	(0.6)
Magnetic Memory Controls Flux	Scan	3/18	195	(0.5)
Spring Measures Pin Pinch	Scan	4/1	115	(0.5)
Displaced Mercury Speeds Up Contact	Scan	9/16	177	(0.5)
Connector Spin Assures Clean Touch	Scan	9/16	178	(0.5)
Magnetic Field Meters Molten Metal Flow	Scan	10/28	151	(0.5)
Rotating Magnets Form Mercury Pump	Scan	11/11	197	(1.0)
Four-in-One Cubes Speed Flash Photography	DIA	9/30	26	(1.0)

19. Systems, Drives, Assemblies

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Electronic Pathways in Synthetic Worlds	(Article)	6/24	132	(2.0)
Drive Types	Campbell	EM 12/16	109	(4.0)
Drive Selection	MacMeans	EM 12/16	113	(5.0)
Servo Components for Numerical Control	Kelling	10/14	234	(4.2)
Remembering Conveyor Belt	Trends	1/7	14	(0.6)
New Computer and Language Offered by Honeywell	Trends	2/18	157	(0.5)
Tiny Translator Listens to Morse, Talks English	Trends	6/24	14	(0.5)
Field Engineers Kept Up to Date by Computer	Trends	8/5	113	(0.6)
Wescon Gives Five Design Awards	Trends	9/2	23	(2.0)
Human Muscles Teach Movement to an Artificial Arm	Trends	9/16	10	(0.5)
Computer Masterminds Automatic Drafting Machine	Trends	10/14	223	(0.8)
Infrared Radiation Links Computers	Trends	10/28	166	(0.5)
Stop-Action Computer Printout Depicts Waves	Trends	11/11	222	(0.5)
4000 Engineers Get Quick Service from Single Computer	Trends	11/25	184	(0.7)
Electron Beam Sets Type by Patching Symbols Together	Trends	12/23	12	(0.6)
Laser TV Camera Sees in the Dark	Trends	12/23	14	(1.3)
Magnetically Controlled Oil Shear Regulates Drive	Scan	11/25	159	(1.0)
Strobe Light Automates Milling Machine	DIA	4/15	33	(1.0)
Finger Tingling Door Bell Serves Blind and Deaf	DIA	4/15	42	(0.5)
Tester Tries Match-Head-Size Computer Cores	DIA	5/27	36	(1.0)
Computer Controls Golf-Course Simulator	DIA	7/8	26	(1.0)
Capstan System Handles Memory Tape Gently	DIA	7/22	26	(1.0)
Load Cell System Maintains Precise Roll Gap	DIA	8/5	32	(0.5)
Electronic Drives Synchronize Planetary Motions	DIA	12/9	22	(2.0)

Fluid Drives, Controls and Systems

21-23. Fluids, Conditioners, Conductors

Plastic Pressure Hose	Stay	2/4	119	(2.0)
High-Temperature Hydraulic Fluids	Spar	2/4	146	(3.8)
Selecting Hydraulic Tubing	Bisaillon	8/19	197	(2.0)
Fire-Resistant Fluids	Henrikson			
		11/11	231	(5.4)
Flexible Metal Hose	Daniels and Cleveland			
		11/25	187	(2.0)
Fluid Power Fallout from Space Program	Trends	9/16	189	(0.6)
Molded Felt Spurs New Trend in Filter Design				
Spin Compensates for Viscosity Change	Scan	9/30	136	(2.0)
Twisted Blades Provide Bidirectional Mixing	Scan	1/21	163	(1.0)
Nested Fin-Tube Exchanger Provides Continuous Heat Path	Scan	4/1	115	(0.5)
Spiralled Channels Form Nested Heat Exchanger	Scan	11/11	196	(0.5)
Bottomless Tank Keeps Oil Clean	Scan	11/25	158	(0.5)
Heat and Pressure Exchangers Keep Desalination Plant's Fuel Bill Low ..	DIA	3/4	30	(0.5)
	DIA	11/11	34	(1.0)

24, 25. Pumps, Motors, Cylinders, Power Devices

Explosive Actuators	Grow	2/4	116	(3.0)
Powering Hydraulic Pumps	Hudson	7/8	129	(4.0)
Understanding Hydraulic Motors	Henke	12/23	102	(8.0)
Thermoelectric Generator Powers New Liquid-Metal Pump	Trends	5/27	10	(0.5)
Pump Body Sequences Valve Ports	Scan	1/7	124	(1.0)
Vented Piston Eliminates Blow-By	Scan	3/4	125	(0.6)
Linear Actuator Provides Rotary Output	Scan	3/18	177	(0.5)
Slamless Pistons Provide Reciprocating Motion	Scan	4/1	116	(0.5)
Expandable Rotor Compensates for Viscosity	Scan	4/15	162	(0.5)
Expandable Sleeve Locks Cylinder	Scan	5/27	139	(0.5)
Lift Actuates Vacuum Grip	Scan	9/2	124	(0.5)
Rolling Diaphragm Forms Sealless Piston	Scan	11/25	158	(0.5)
Self-Adjusting Bellows Cradle Telescope Mirror	DIA	2/18	26	(1.0)
Garden Tractor May Become Shiftless Vehicle	DIA	3/18	30	(1.0)
Air-Balanced Hoist Simulates Zero-g	DIA	6/24	30	(1.0)
Compensating Spring Keeps Mercedes on the Level	DIA	9/2	32	(1.0)
Tiny Rams Boost or Check Freight-Car Speed	DIA	10/14	30	(1.0)

26. Seals, Packings, Gaskets

Matching Seals and Lubricants	Stephens	1/21	172	(5.0)
Metal-to-Metal and Metal-Gasketed Seals	Rathbun	8/5	158	(4.4)
Metal Joints and Collapsible Rings Hold Glass-Sub Sections Together		6/10	14	(0.8)
"Pumping" Seal Holds Back Molten Potassium	Trends	8/5	150	(0.6)

Pumping Seals Hold Back Leakage	Trends	10/28	170	(1.0)
Pressure Tightens One-Piece Ring Seal	Scan	9/16	178	(0.5)
Deformable Orifice Regulates Flow	Scan	11/11	195	(0.5)

27. Valves

High-Speed Fluid Amplifier	Wood	3/4	119	(5.0)
Pure Fluid Devices	Wood	6/24	153	(27.0)
Fluidics and Fluid Power	Henke	11/25	190	(4.5)
Pure-Fluid Amplifiers Go Commercial ..	Trends	2/18	187	(0.6)
Vortex Valve Brings Fluidic Control to Hydraulic Servos	Trends	11/25	186	(1.0)
Vacuum Valve Operates Itself	Scan	1/21	165	(0.6)
Tapered Diaphragm Stops Valve Chatter	Scan	5/27	138	(1.0)
Spiral Groove Adjusts Flow	Scan	7/8	125	(1.0)
Expandable Cone Forms Variable Orifice	Scan	7/22	147	(0.5)
Buckling Flat Spring Closes Valve	Scan	10/14	201	(0.5)
Suspended Coil Eliminates Magnetic Hysteresis	Scan	12/9	154	(0.5)
Wound Spring Flips Valves Reverse Water Jets	DIA	6/10	26	(1.0)
Switch-Pitch Pump Blades Vary Cooling Water Flow	DIA	6/10	29	(1.0)

28. Instruments & Controls

Controlling Liquid Level	Simonin	10/14	209	(5.0)
Fluidics Pass Missile-Steering Flight Test	Trends	8/19	171	(0.5)
Fluidic "Eye" Senses Without Contact ..	Trends	12/9	180	(0.7)
Air Pressure Indicates Tension	Scan	1/21	164	(0.5)
Race-Mounting Beefs Up Turbine	Scan	2/18	170	(1.0)
Laminar Flow Provides High Gain Pressure Control	Scan	7/22	147	(0.5)
Leaky Spring Indicates Angular Position ..	Scan	7/22	187	(0.5)
Fluid Pressure Indicates Shaft Position ..	Scan	9/30	117	(1.0)
Resonant Circuit Measures Liquid Level ..	Scan	11/11	198	(0.5)

29. Systems & Assemblies

High Vacuum Systems	Letham	2/4	121	(20.0)
Heat in Hydraulic Systems	Allen	3/4	153	(5.7)
Hydraulic Servosystems	Henke	5/27	146	(9.0)
A-F Hydraulics	Henke	9/2	144	(2.0)
Lubrication with Process Fluids	Arwas & Peterson			
		10/14	215	(5.0)
'Gatling Gun' Puts Out Fires	Trends	2/4	12	(0.5)
Hydraulic Systems Function after Twenty-Three Years on an Icecap Air Chamber Provides Constant-Height Support	Trends	12/9	6	(2.0)
Inflated Seal Dogs Down Lock Latch ..	Scan	3/4	126	(1.0)
Surging Water Stabilizes Rolling Ship ..	Scan	3/18	175	(0.6)
Split Control-Surface Circuits Protect Jet Liner	DIA	4/15	36	(1.0)
Programmed Water Jets Drive Swimming-Pool Sweeper	DIA	7/8	28	(1.0)
	DIA	9/30	22	(2.0)

Mechanical Drives, Controls and Systems

31. Engines, Atomic Power, Power Sources

Tiny Turbines	Barnes	4/1	101	(3.0)
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Birth of a Breeder	Wood	9/2	116	(2.0)
Plasma: The Fourth State of Matter ..	(Article)	10/14	181	(3.0)
Power by the Handful	Barnes	10/14	184	(6.0)
Solid Rocket Propellant Drives Homing Torpedo	(Article)	11/25	142	(4.0)
427 cu. in. Auto Engine Develops "About 600 hp"	Trends	1/7	10	(0.8)
Tiny Turbojet Creates Big-Engine Bursts of Power	Trends	1/21	12	(0.6)
Solid Rocket Creates 3,000,000 lb of Thrust	Trends	3/18	12	(0.6)
Radioisotopes Are Given the Nod as Simple Power Producers for Space ..	Trends	4/1	10	(0.6)
120-in. Solids Are Ready for Work	Trends	5/13	10	(0.7)
Solid Rockets Prove Their Multiple-Restart Capability	Trends	5/27	14	(0.5)
Six-Engine Copter Will Fly on Five Noisy Gases Pinpoint Cylinder Blow-By and Scoring	Trends	6/24	12	(0.5)
Ignored Powerplant Needs Fueling Every Five Years	Trends	9/16	185	(0.6)
Rotary Engine Finds a Home in a Generator	Trends	9/30	14	(0.6)
Two-Stage Wankel Engine Makes Debut ..	Trends	11/11	12	(0.5)
Payout System Guides Cable Gently Into the Sea	Trends	11/11	226	(0.5)
	DIA	1/7	22	(2.0)

Low-Cost Fuel Injection Systems Designed for Passenger Cars	DIA	1/21	24	(1.0)
Array of Shock Dampers Guards Stern-Drive Engine	DIA	6/24	24	(1.0)
Warship Powerplant Mates Diesels and Turbines	DIA	8/5	30	(1.0)

32-34. Drives, Transmissions, Drive Components

Scoring of Gears	Borsoff	1/7	132	(5.0)
Chains	Pearce	MD 6/17	4	(4.0)
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		MD 6/17	8	(6.0)
Flat Belts	Zaiss	MD 6/17	14	(4.0)
Gears	Crawshaw	MD 6/17	18	(6.0)
Gear Drives	Wadlington	MD 6/17	24	(2.6)
Belt and Chain Drives	Malcom	MD 6/17	26	(3.4)
Friction and Traction Drives	Burnett	MD 6/17	30	(3.0)
Impulse Drives	Hein	MD 6/17	33	(1.0)
Base-Mounted Reducers	Whelan	MD 6/17	37	(3.5)
Shaft-Mounted Reducers	Chung	MD 6/17	40	(1.5)
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Compound Planetaries	Myers	9/2	134	(3.0)
Vibration in Geared Systems	Rieger	9/16	164	(10.0)
Horsepower Capacity of Self-Lubricated Chain	Edgerton	9/30	121	(7.0)

Gear Tolerances: Part 1—Gears	Dean	10/28	138	(12.0)
Gear Tolerances: Part 2—Gear Blanks	Dean	11/11	206	(9.0)
Tape and Film Drives	Longmire	11/11	215	(7.0)
Dual Ball Drive Adjusts Output	Scan	3/18	174	(1.0)
Adjustable Slot Controls Cam	Scan	6/10	159	(0.5)
Cushioned Gears Smooth Torque Pulses	Scan	7/8	126	(0.5)
Magnetic Gears "Mesh" Without Contact	Scan	9/30	120	(1.0)
Cam-Controlled Planet Alters Gear-Train				
Output	Scan	11/25	157	(1.0)
Differential Lock Boosts Tractor Pull	DIA	5/13	32	(1.0)
Differential Gearing Rotates 3-D CRO				
Display	DIA	9/2	30	(1.0)
Satellite-Gear System Improves Wankel				
Speed Range	DIA	10/28	32	(0.5)
Planetary Gears Give Crane Dual				
Hoisting Speeds	DIA	12/23	24	(1.0)

351, 352. Bearings

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Hydrodynamic Gas Bearings	Methlie	3/18	164	(6.0)
Optimum Bearing Span	Terman	7/27	159	(4.0)
Flexure-Pivot Bearings—Part 1	Weinstein	6/10	150	(8.0)
Flexure-Pivot Bearings—Part 2	Weinstein	7/8	136	(10.0)
Preload in Bearings	Swanson	7/22	174	(6.0)
Flexure Hinges	Paros	11/25	151	(6.0)
Conical Pivot Bearings	Herzl	12/9	146	(7.0)
Huge Brakes and Oil-Film Bearing Po-				
sition Superaccurate New Telescope	Trends	10/28	12	(0.8)
Flexible Race Accommodates Bearing-				
Temperature Differential	Scan	4/29	214	(0.6)
Bearing Quills Eliminate Retainer Rub	Scan	6/24	141	(1.0)
Bleed-Out Reservoir Provides Long-Time				
Self-Lubrication	Scan	7/8	126	(0.5)
Double Bearing Turns and Travels	Scan	9/16	177	(0.5)
Pivot-Bearing Shell Aligns Pads	Scan	9/30	118	(0.5)
Pneumatic Load Adjusts Bearing Preload	Scan	10/14	200	(0.5)
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353-355. Couplings, U-Joints, Shafts

Constant-Velocity Universal Ball Joints	Miller	4/15	184	(4.3)
Estimating Universal Joint Performance				
Variations	Lee	7/8	151	(3.0)
Torque Converters	Witty	MD 6/17	34	(3.0)
Fluid Couplings	Lavoie	MD 6/17	51	(2.0)
Couplings	Grundtner	MD 6/17	59	(6.0)
Universal Joints	(Chapter)	MD 6/17	65	(4.0)
Flexible Shafts	Zambetti	MD 6/17	69	(3.0)
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Pneumatic-Hydraulic Balance Controls				
Clutch Torque	Scan	2/4	112	(1.0)
Triple-Nested Springs Form Universal				
Joint	Scan	2/18	171	(0.6)
Circular Spring Softens Gear Shock ..	Scan	3/4	124	(1.0)
Deformable Sleeves Absorb Shock in				
Coupling	Scan	4/1	114	(0.5)
Wrapped Cord Forms Spiral "Teeth" ..	Scan	4/1	117	(0.5)
Cantilevered Gears Permit Planetary Flex	Scan	5/13	188	(1.0)
Torsion Bars Form Variable-Speed Trans-				
mission	Scan	6/10	158	(1.0)
Coupling Varies Stiffness According to				
Torque	Scan	8/5	128	(1.0)
Retarded Spin Allows Full-Speed Coupling	Scan	12/23	110	(1.0)
Bogieless Railway Car Turns on Skewed				
Axles	DIA	7/8	31	(1.0)
Cross-Shaft Protects STOL Aircraft....	DIA	12/9	26	(1.0)

356. Clutches, Brakes

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Miniature Electric Clutches and Brakes:				
Part 1—Friction-Disc Types	Pech	4/15	150	(9.0)
Miniature Electric Clutches and Brakes:				
Part 2—Nonfriction Types	Pech	4/29	223	(5.0)

Electric Brakes	Lavoie	MD 6/17	56	(2.4)
Electric Clutches	Pech	MD 6/17	46	4.4)
Mechanical Clutches	Harrison	MD 6/17	42	(4.6)
Mechanical Brakes	Dombeck	MD 6/17	53	(3.6)
Brake Capacity	Mathews	10/28	176	(2.8)
Intertwined Racks Actuate Two-Way				
Clutch	Scan	4/29	212	(1.0)
Shuttling Segment Provides One-Way				
Drive	Scan	6/10	161	(1.0)
Mower Safety Brake Saves Fingers and				
Toes	DIA	2/18	22	(0.8)
Rolling Flywheel Diagnoses Brake Be-				
havior	DIA	8/5	28	(1.0)
Rocking-Caliper Disc Brake Insures Even				
Wear	DIA	11/11	40	(0.5)

36. Mechanisms

Geneva Mechanisms	Fenton	1/21	177	(6.0)
Sliding-Axle Analog Mechanisms	Bouso	3/4	134	(4.0)
Geneva Wheel Inertia	Weiss	4/15	181	(2.0)
Determining Cam Profiles	Myatt	6/10	174	(3.0)
Toggle Mechanisms	Saelman	7/22	185	(2.5)
Bearing Reliability and Capacity	Mischke	9/30	139	(2.0)
Storable Tubular Extendible Member	Rimrott	12/9	156	(10.0)
Intermittent Rotary Motion	Bickford	12/23	119	(13.0)
Pull Tightens Grippers Pinch	Scan	1/7	125	(0.5)
Rectangular Cam Makes "Push-Push"				
Switch	Scan	2/4	115	(0.7)
Orbiting Ball Provides High-Speed Wiggle	Scan	3/18	178	(0.5)
Balanced Lever Governs Torque	Scan	4/1	113	(1.0)
Tunable Stethoscope Listens Discriminate-				
ly	Scan	4/29	215	(0.6)
Convex Cam Clamps Itself	Scan	5/13	191	(0.6)
Pawls Deliver Uniform Torque	Scan	5/27	139	(0.5)
Flexible Diffuser Adjusts to Air Flow	Scan	6/24	143	(1.0)
Piston Cam Actuates Cutter	Scan	7/22	146	(0.6)
Stepped Pawls Subdivide Ratchet In-				
crement	Scan	7/22	148	(0.5)
"Saw-Tooth" Blades Vary Mix Speed ..	Scan	8/19	157	(1.0)
Disappearing Cam Lobe Controls Engine				
Valve	Scan	8/19	160	(0.5)
Rolling Crank Amplifies Motion	Scan	9/2	123	(1.0)
Linkage Adjusts Itself for Temperature				
Changes	Scan	9/2	124	(0.5)
Slide Track Indexes Whirling Plug-In ..	Scan	9/16	174	(1.0)
Split Arbor Flexes to Grip	Scan	10/28	152	(0.5)
Spring-Floats Fingers Regulate Torque	Scan	12/23	132	(0.5)
Radial Squeeze Secures Shaft-Mounted				
Parts	Scan	12/23	132	(0.5)
Loading Ramp Automatically Finds Truck	DIA	1/7	32	(0.6)
Mechanical Thumb Flips Paperback's				
Pages	DIA	2/18	22	(1.2)
Rolling-Contact Cams Vary Suspension				
Spring Rates	DIA	2/4	23	(1.0)
Off-Road Truck Tucks Up Wheels to				
Dump	DIA	4/1	32	(1.0)
Japanese Excavator Digs and Dumps				
with Swinging Booms	DIA	4/29	39	(0.7)
Swing-Out Rollers Speed Printing Press				
Output	DIA	8/19	31	(1.0)

37, 39. Controls and Systems

Hot Squeeze Pushes Piston	Scan	4/15	162	(0.5)
Paired Gratings Measure Light Angle ..	Scan	4/29	213	(0.6)
Intermeshed Fingers Control Drag	Scan	7/8	127	(0.5)
Notched Latch Provides Torque Fuse ..	Scan	7/8	128	(1.0)
Paddle Wheels form Digital Readout ..	Scan	3/18	176	(1.0)
Displaced Image Measures Torque	Scan	3/18	178	(0.5)
Speed-Sensitive Pitch Adjustment	Scan	7/8	127	(0.5)
Speed-Sensitive Balls Adjust Rotor				
Balance	Scan	9/30	119	(1.0)
Spring Push Limits Fan Speed	Scan	10/28	150	(1.0)
Paper Pincher Detects Double Documents	DIA	6/10	22	(2.0)
Sweeping Switch Arm Operates Thre-				
digit Readout	DIA	9/2	37	(0.5)

Assembly Components

41. Fasteners

Plastic Fasteners	Poe	1/7	127	(5.0)
High Temperature Joints	Baumgartner			
		1/21	166	(6.0)
Metal/Plastic Assemblies	Ehner	2/18	183	(3.0)
Terminology	Belford	F 3/11	4	(4.0)
Fastener Materials	(Chapter)	F 3/11	8	(4.0)
Finishes and Coatings	(Chapter)	F 3/11	12	(3.0)
Joint Design	(Chapter)	F 3/11	15	(14.0)
Fastener Evaluation	Brenner	F 3/11	29	(3.0)

Tapping Screws	(Chapter)	F 3/11	32	(6.0)
Set Screws	Kull	F 3/11	38	(4.0)
Studs	Waltermire			
		F 3/11	42	(2.0)
Resistance Welded Fasteners	Grey	F 3/11	44	(3.0)
Arc-Welded Fasteners	Singleton	F 3/11	47	(4.0)
Locknuts	(Chapter)	F 3/11	51	(4.0)
Single-Thread Engaging Nuts	Seitz	F 3/11	55	(3.0)
Anchor Nuts	Mihaly	F 3/11	58	(2.0)
Caged Nuts	Seitz	F 3/11	60	(2.0)
Clinch Nuts	Massey	F 3/11	62	(2.0)
Self-Piercing Nuts	Steward	F 3/11	64	(2.0)

Inserts	Mussgnug	F 3/11	66	(4.0)
Washers	Hurst	F 3/11	70	(4.0)
Sealing Fasteners	(Chapter)	F 3/11	74	(4.0)
Pin Fasteners	Braendel	F 3/11	78	(5.0)
Small Rivets	(Chapter)	F 3/11	83	(4.0)
Blind Rivets	Freeman	F 3/11	87	(3.0)
Spring Clips	Seltz	F 3/11	90	(6.0)
Stamped Retaining Rings	Wurzel	F 3/11	96	(3.5)
Wire-Formed Retaining Rings	Munsey	F 3/11	99	(3.0)
Spiral-Wound Retaining Rings	McCormick	F 3/11	102	(5.5)
Quick-Operating Fasteners	Barry	F 3/11	108	(4.0)
Matching Fastener Holes	Bennett	4/1	127	(2.0)
Resistance-Welded Fasteners	Olszewski	6/10	169	(5.0)
Bolt Point Reactions	Y'enger	6/24	181	(2.0)
Nut Design Factors	Viglione	8/5	137	(5.0)
Machine Set Studs	Johnson	8/19	166	(3.0)
Fastener Preload	Blake	9/30	128	(4.0)
Explosion in Tubing Gently Separates				
Rocket Stages	Trends	4/29	10	(0.6)
Double Nut Provides Two-Speed Linear Drive	Scan	2/18	172	(1.0)
Screws Drive Telescoping Cylinder	Scan	3/18	177	(0.5)
Push-Pull Nut Tightens Without Torque	Scan	8/5	126	(1.0)
Collapsible Notches Yield Continuous Ring	Scan	9/16	175	(0.5)
Segmented Nut Separates Explosively	Scan	9/30	118	(0.5)
Dual Threads Double-Lock Blind Fastener	Scan	10/14	198	(0.5)
Cocked Washer Provides Torqueless Screw Lock	Scan	10/14	198	(0.5)
Slotted Bolt Locks Itself	Scan	10/14	200	(0.5)
Flexible Threads Distribute Load	Scan	10/28	152	(0.5)
Spherical Seat Accommodates Bolt Tilt	Scan	10/28	175	(0.5)
Retaining O-Rings Ease Coupling Assembly	Scan	11/11	196	(0.5)

42. Springs; Vibration and Shock Isolators

Air Springs	Hirtreiter	4/1	104	(9.0)
Maximum Velocity of Springs	Morcos	6/24	145	(4.0)
Elastomeric Mounting Systems	Meyer	6/24	184	(3.4)

Vibration-Isolation Systems: Part 1	Feinberg	7/22	138	(7.0)
Vibration-Isolation Systems: Part 2	Feinberg	8/5	142	(8.0)
Spring Selection Simplified	Johnson	9/16	192	(5.0)
Built-In Damping: Part 1—The Theory	Thorn	11/25	174	(6.0)
Built-In Damping: Part 2—The Design Method	Thorn	12/9	166	(6.0)
Belleville Washer Relieves Pressure	Scan	1/7	125	(0.5)
Flat-Wire Spring Pushes in All Directions	Scan	3/4	127	(0.6)
Two Stage Isolator Does Double Duty	Scan	5/13	187	(1.0)
Resilient Ring Provides Soft Bearing Mount	Scan	5/13	189	(0.6)
Buckled Springs Lift Platform	Scan	6/10	159	(0.5)
Spring Reinforces Coupling	Scan	6/10	160	(0.5)
Spring Clutch Locks Nut	Scan	6/10	160	(0.5)
Cantilever Springs Maintain Hot Wire Tension	Scan	6/24	142	(0.5)
Suspended Tape Cancels Vibration	Scan	6/24	144	(0.5)
Squeezed Spring Accommodates Seal Fluctuations	Scan	10/14	197	(1.0)
Deforming Wire Absorbs Shock	Scan	12/23	111	(1.0)
Suspended-Cable Floor Eliminates Audible Reflections	Scan	12/23	112	(0.5)
Multi-Wheel Trailer Integrates Undulations	DIA	4/1	34	(0.5)
Hydraulic Crash Barrier Cushions Car Impact	DIA	10/14	40	(1.0)

43. Other Assembly Components

Designing Lifting Attachments	Moore	3/18	181	(4.7)
Music-Wire Tire Will Absorb Road Shocks on the Moon	Trends	1/21	14	(0.6)
Rotating Cushions Float New Transporter Over Any Terrain	Trends	5/13	12	(0.5)
Joint Makes Tubes Self-Clamping	Scan	7/22	148	(0.5)
Flexing Beam Permits Knob Override	Scan	8/5	127	(0.5)
Flip-Flop Latch Indicates Position	Scan	10/14	199	(0.6)
Meshed Gear Segments Form Continuous Hinge	Scan	11/11	198	(0.5)
Bolt-On Rollers Make Semipermanent Conveyor System	DIA	3/4	28	(0.5)

Materials

51. Ferrous Metals

High-Alloy Ultra High Strength Steels...	Hamaker	6/10	187	(5.0)
Fatigue in Constructional Steels: Part 1—Basic Considerations	Martin	8/5	130	(7.0)
Fatigue in Constructional Steels: Part 2—Application of Fatigue Data	Martin	8/19	161	(5.0)
Gray, Ductile, and High-Alloy Irons	Walton	M 9/9	4	(7.0)
Malleable Iron	Heine	M 9/9	11	(3.0)
Carbon and Low-Alloy Steels	Briggs	M 9/9	14	(5.0)
High-Alloy Steels	Schoefer	M 9/9	19	(6.0)
Carbon Steels	Parker	M 9/9	25	(7.0)
High-Strength Low-Alloy Steels	Sullavin	M 9/9	32	(4.0)
Low and Medium-Alloy Steels	Whiteley	M 9/9	36	(4.0)
Stainless Steels	Kopecki	M 9/9	40	(4.0)
High-Temperature, High-Strength, Iron-Base Alloys	Johnson	M 9/9	44	(5.0)
Ultrahigh-Strength Steels	Hall	M 9/9	49	(2.0)
Free-Machining Steels	Nachtman	M 9/9	51	(3.0)
Understanding Fatigue in Metals	Kling	10/14	202	(7.0)
Steel Head Shapes	Glazebrook	10/28	159	(4.0)
Super 12-Cr Steels	Parker	11/25	160	(12.0)
Deep Diving Alvin Relies on High-Alloy Sphere	Trends	6/24	12	(0.5)
ASTM Recognizes Controlled Ferrite in Alloy Castings	Trends	8/19	170	(1.0)
Frequency Change Tells Metal's Hardness	DIA	5/27	41	(0.5)

52. Nonferrous Metals

Continuous-Cast Copper-Base Alloys	Bailey	2/4	106	(6.0)
High-Strength Aluminum Alloys	Boone	2/18	164	(6.0)
Welded Aluminum Parts	Collins	3/4	128	(6.0)
Aluminum	Rowe	M 9/9	54	(11.0)
Copper	Strubell	M 9/9	65	(8.0)
Nickel	Hall	M 9/9	73	(8.0)
Magnesium	Hanawalt	M 9/9	81	(5.0)
Zinc	Horvick	M 9/9	86	(3.0)
Titanium	Erbin	M 9/9	89	(4.0)
Beryllium	Hawk	M 9/9	93	(2.0)
Refractory Metals	Chellus	M 9/9	95	(4.0)
Precious Metals	Lake	M 9/9	99	(3.0)
Soldering Alloys	Smith	M 9/9	102	(3.0)
Brazing Alloys	Pattee	M 9/9	105	(4.0)
Understanding Fatigue in Metals	Kling	10/14	202	(7.0)
Aluminum for Cryogenic Applications	Kaufman	11/11	199	(7.0)
Two Containers and Cap Win Packaging Design Awards	Trends	4/29	24	(1.0)
Aluminum-Block Engine Powers Chamolais	DIA	1/21	22	(1.0)

53, 54. Plastics, Rubber, Elastomers

Plastic Fasteners	Poe	1/7	127	(5.0)
TFE Fluorocarbon Parts	Ricklin	1/21	152	(5.0)
Polypropylene Linkage	Meyer	3/18	179	(2.0)
Lubricating with Elastomers	Thomas	4/1	136	(2.8)
Whisker-Reinforced Plastics	Milewski	5/13	216	(4.4)
TFE-Lubricated Phenolics	Willis	5/27	130	(8.0)
Polycarbonates	Thomas	6/10	162	(7.0)
Polysulfone	Bugel	7/22	193	(2.1)
Elastomers	Mathews	8/19	177	(20.0)
Plastic Sports Car	Trends	1/21	10	(1.0)
Reinforced Plastics Win Design Awards	Trends	4/15	24	(1.0)
Plastic Design Called Practical for High-Rise Steel Buildings	Trends	9/2	14	(0.6)
Plastic Frame Joins Plastic Body Halves on Experimental Racer	Trends	10/14	10	(0.6)
New Process Casts Plastics by the Mile	Trends	10/28	168	(1.0)
Plastic Racer Named Champion for '65	Trends	1/9	12	(0.7)
Foam Quiets Wind's Whistle	Scan	1/21	164	(0.5)
Sticky Beads Form Intricate Insulation	Scan	5/13	190	(0.6)
Spiral Strip Eliminates Conveyor Bearing	Scan	9/16	176	(0.5)

55-58. Nonmetallics, Composites

Sandwich Panels	Gallagher	1/7	143	(5.0)
Open-Face Sandwich Panels	McKinley	2/4	141	(5.0)
Matching Seals and Lubricants	Stephens	1/21	172	(5.0)
Submarine of Glass	Ernsberger	4/29	186	(7.0)
Brittle Materials	Robinson	9/2	118	(5.0)
Coatings	Beach	M 9/9	116	(6.0)
Filament-Wound Cocoon Could Prevent Submarine Disaster	Trends	2/18	12	(0.5)
Nondestructive Test Predicts Strength of Adhesive Bonds	Trends	3/4	141	(1.0)
Eight-Mil Films Bond the F-111 Fuselage	Trends	6/10	10	(1.0)
Crankcase Oil Helps Prevent Forest Fires	Trends	9/16	14	(0.5)
Glass 'Sub Hulls' Pass Three-Year Submergence Tests	Trends	9/16	24	(0.5)
Sticky-Fingered Machine Tests Adhesives	Trends	9/16	186	(0.6)
Varnishing Process Cuts Motor Costs	Trends	10/14	221	(0.6)
Electrically Conductive Cloth Makes New Heater Types Feasible	Trends	11/25	182	(0.7)
Curved Glass Adds Safety and Comfort to Transit Car	Trends	12/9	10	(0.6)
Iodine Solves Slippery Problem in Exotic Metals	Trends	12/9	179	(0.8)
Honeycomb Proves Best for Small Underwater Vehicles	Trends	12/9	182	(2.0)
Solidification Throws Thermal Switch	Scan	4/29	216	(0.5)
Ripples Boost Corrugation Strength	Scan	9/2	125	(1.0)
Rubber Ram Tests Paper Strength	DIA	3/4	30	(0.5)
Rocking Film Makes 3-D Photo	DIA	6/10	34	(0.5)

Manufacturing Methods and Processes

61-63. Metal Casting, Shaping, Forming

Forging vs. Machining	Divine	5/13	192	(5.0)
Steel Forgings	Parker	7/22	153	(19.0)
Casting	Wallace	M 9/9	122	(4.0)
Forging	Burbank	M 9/9	126	(3.0)
Extruding	Cullen	M 9/9	129	(3.0)
Cold Extruding	Schiller	M 9/9	132	(2.0)
Cold Heading	Havlis	M 9/9	134	(2.0)
Stamping	Carter	M 9/9	136	(2.0)
Deep Drawing	Bartle	M 9/9	138	(2.0)
Spinning	Wenman	M 9/9	140	(2.0)
Roll Forming	Vanderploeg	M 9/9	142	(2.0)
High-Energy-Rate Forming	Zernow	M 9/9	144	(3.0)
Powder Metallurgy	Johnson	M 9/9	149	(2.0)
Designing Stampings	Strasser	11/25	172	(2.0)
Punched Holes in Stampings	Strasser	12/23	113	(3.0)
Die Castings Guide the Nike Hercules	Trends	5/27	24	(0.5)
Superplasticity Promises New Metal-Forming Methods	Trends	7/8	147	(1.0)
Hybrid Process Makes Die-Cast Forgings in Brass	Trends	7/22	183	(1.0)
Support Rollers Aid Cylinder Forming	DIA	2/4	30	(0.5)
Self-Feeding Precision Forge Generates Rounds and Squares	DIA	4/15	26	(2.0)
Bar-Bender Rolls Curl Heavy Stock	DIA	9/16	34	(0.5)

64. Metal Joining

Welded Aluminum Parts	Collins	3/4	128	(6.0)
Bonding and Welding Dissimilar Metals	Gatzek	4/29	270	(6.2)
Laser Welding	Miller	8/5	120	(6.0)

Welding and Welding Alloys	Rudy	M 9/9	109	(7.0)
Diffusion Welding	Albom	9/16	179	(4.0)
Ultrasonic Joining	Gellert	12/23	136	(2.6)
Cold Welding Called Promising as Manufacturing Technique	Trends	6/10	14	(0.5)
Zero Leakage Now a Realistic Goal	Trends	9/16	188	(1.0)
Dual Triggers Fire Four-Step Welding Gun	DIA	2/4	30	(0.5)
Pistol-Like Magazine Feeds Stud Welder	DIA	3/18	26	(1.0)
Wedges Secure Fastener-Free Aluminum Hull	DIA	5/13	42	(0.7)
Electron-Beam Focus Can Be Changed During Operation	DIA	6/10	32	(1.0)
Desoldering Irons Inhale Molten Metal	DIA	11/11	37	(1.0)

65-68. Machining, Other Processes

Forging vs. Machining	Divine	5/13	192	(5.0)
Joining of Thermoplastics	Burns	5/27	184	(4.5)
Ion-Sputtered Thin Films	Seeman	8/19	200	(3.8)
Machining	Olofson	M 9/9	147	(2.0)
New Etching Process Produces Sharp Detail	Trends	11/25	180	(0.6)
Transducers Control Space Age Spinning Wheel	DIA	4/15	30	(1.0)
Hot-Coating Process Protects Gears or Gaskets	DIA	4/29	32	(2.0)
Die Stack Shaves Tiny Teeth in Gear Blank	DIA	4/29	36	(1.0)
Oscillating Abrasive Wire Slices Semiconductor Crystals	DIA	5/13	39	(1.0)
Laminater Glues Up Beams From Boards	DIA	8/19	28	(1.0)

Design Theory and Techniques

71. Mechanics, Dynamics, Vibration

Vibration Parameters	Korzec	4/1	133	(3.0)
Reflected Inertia	Bowers	8/5	157	(2.0)
Stresses for Vibration Measurement	Kivenson	9/2	126	(8.0)
Estimating Natural Frequencies	Reinert	10/14	227	(6.0)
New Analysis Method Pins Down Vibration in Weldments	Schmitt	12/9	172	(7.0)
Shuttling Wires Transmit Vibration	Trends	10/28	169	(1.0)
Push-Pull Wires Indicate Torque	Scan	10/14	201	(0.5)
Test Table Tunes Out Random Vibration	Scan	12/23	112	(0.5)
Resonant Masses Shake Sorting Screen	DIA	1/21	23	(1.0)
	DIA	1/21	28	(0.5)

72, 73 Strength of Materials, Parts

Predicting Part Failures—Part 1	Johnson	1/7	137	(6.0)
Predicting Part Failures—Part 2	Johnson	1/21	157	(6.0)
High Temperature Joints	Baumgartner	1/21	166	(6.0)
Fatigue Stress Using Mohr's Circle	Little	3/4	143	(6.0)
Ring Redundancy	Isakower	3/4	149	(3.0)
Natural Frequencies of Cantilevered Ring Segments	Ojalvo	3/18	191	(4.5)
Precision Elastic Limit	Jennings	4/15	163	(3.0)
Bending Moments in Circular Plates	Boutier	4/29	233	(2.0)
Counteracting Gasket Creep	Smoley	5/27	142	(4.0)
Preventing Fatigue Failure	Kaechele	7/22	188	(2.2)
Bending Without Twisting	Johnson	11/11	227	(3.0)
Rotating Shaft Deflection	Hesse	12/9	185	(4.6)
Stress Concentrations for Holes in Cylinders	Little	12/23	133	(3.0)

74. Human Factors, Industrial Design

Survival in the Marginals	(Article)	1/7	110	(5.0)
Space Suit Progress—1: Dress Rehearsals for Apollo	Barnes	2/4	100	(6.0)
Space Suit Progress—2: Hot Stunt Men and Hydraulic Stand-Ins	Barnes	2/18	160	(4.0)
Human Vibration Limits	Barnes	6/10	144	(6.0)
Warning-Systems Design	Seminara	9/30	106	(11.0)
Computer 'Corrects' the Road During Auto-Drive Reaction Studies	Trends	2/4	10	(0.7)
Safety and Entertainment Stressed in New Idea Car	Trends	2/18	10	(0.6)
Zero-Friction Vehicle Zero-g for Astronauts	Trends	3/4	14	(0.7)
Zero-Gravity Bed Buoy a Patient and Relieves His Pain	Trends	5/13	12	(0.5)
"Marinated" Researchers Test Zero-G Reactions	Trends	9/30	10	(0.5)

IDSA Presents Design Awards	Trends	10/14	22	(1.6)
Crashing Cadavers Contribute to Dummy Design	Trends	11/11	12	(0.5)
Air-Spring Seat Conforms to Any Size Truck	DIA	5/13	26	(2.0)
Scuba Life Jacket Safeguards Downed Pilot	DIA	8/19	26	(1.0)
Styling Keynotes German 66's	DIA	11/25	26	(0.5)
Turning Lens Duplicates Human Field of View	DIA	11/11	26	(2.0)

75. Design Analysis, Dimensioning

Sandwich Panels	Gallagher	1/7	143	(5.0)
Fatigue Stress Using Mohr's Circle	Little	3/4	143	(6.0)
Geometric Computing—Part 1: The Method and Its Application	Gellert	3/18	152	(8.0)
Redundancy	Nichols	3/18	170	(4.0)
Natural Frequencies of Cantilevered Ring Segments	Ojalvo	3/18	191	(4.5)
Geometric Computing—Part 2: Fields of Application	Gellert	4/1	94	(7.0)
Feedback Control Systems: Part 1—Tools of the Trade	Branson	4/15	166	(5.0)
Nomographs from Experimental Data	Bolthouse	4/15	171	(3.0)
Geneva Wheel Inertia	Weiss	4/15	181	(2.0)
Feedback Control Systems: Part 2—Deriving Block Diagrams	Branson	4/29	217	(6.0)
Feedback Control Systems: Part 3—Graphical Techniques	Branson	5/13	201	(5.0)
Graphic Data Processing	Smith	5/27	117	(7.0)
Natural Frequencies of Thin Rectangular Plates	Vet	6/10	183	(3.0)
Designing Rotary Inertia Systems	Mischke	6/24	134	(7.0)
Verifying the Installation of Products	Finch	8/5	102	(6.0)
Thin Cantilever Beams	Roth	9/2	137	(3.0)
Analyzing Mechanisms with an Analog Computer	Meyer	9/2	147	(3.0)
Temperature Change in Hydraulic Systems	Keller	10/28	153	(6.0)
Momentary Peak Shaft Loads	Dodge	10/28	163	(3.0)
Developing Schematics	Tuplin	10/28	171	(4.5)
Plain-Talk Computer Cuts Calculating Time	Feist	11/11	186	(8.0)
Proposed Helicopter: Swiveling Tail Rotor and Steers	Trends	4/15	14	(0.6)
Computer-aided Drafting 25 Times Faster than Man	Trends	5/13	14	(0.6)
Signatures in Sound Diagnose Machine Illnesses	Trends	6/24	129	(0.5)
Computer Processes Engineering-Change Notices	Trends	8/19	14	(0.6)
Design Data to Manufacturing Instructions in Minutes	Trends	9/30	134	(2.0)
Gemini Rendezvous Practiced in Sliding Simulator	Trends	11/25	185	(0.8)
	DIA	1/7	28	(1.0)

76. Basic Sciences

Progress Toward Intelligent Machines ..	Griffith	1/7	148	(3.5)
Exploiting the Oceans	Stephan	3/4	114	(5.0)
Mounting Optical Elements	Cade	7/8	133	(3.0)
Infrared	Leftwich	9/16	154	(6.0)
Optics and Optoelectronics	Tippett	10/28	180	(0.6)
Gamma Beam Teams with Radar to Warn Pilots of Dangerous Air	Trends	11/11	22	(0.5)
Overlapping Images Measure Rod Diameter	Trends	4/15	160	(1.0)
Liquid-Metal Studies Pinpoint Radiator-Design Problems	Trends	9/16	14	(0.5)
Force-Field Theory Explains Molecular Sieve's Shortcomings	Trends	11/11	22	(0.5)
Optical Lever Measures Displacement ..	Scan	5/27	150	(0.5)
Wiggling Mirror Indicates Cavity Shape	Scan	8/5	129	(1.0)
Vibrating Mirrors Indicate Light Beam Position	Scan	9/16	175	(0.5)
Circulating Sand Heats Air	Scan	9/16	176	(0.5)
Fly's-Eye Lens Makes 1250-Image Photo	DIA	2/4	28	(1.0)

77. Experimental, Advanced Design

Are Bigger Machines Better?	Wise	5/27	124	(6.0)
Progress Report on Rigid Rotors	Trends	1/7	12	(0.5)
400 mph Called Feasible for Rigid Rotor Helicopter	Trends	1/7	12	(0.5)
Profilometer Shows Road Blemishes Can Ruin the Ride	Trends	2/4	12	(0.5)
Progress Reported on Two Apollo Boosters	Trends	2/18	14	(0.5)
Hot Gas Spins Helicopter Rotor	Trends	2/18	14	(0.5)
Meteoroids Riddle Pegasus Wings As Scheduled	Trends	3/18	14	(0.6)
SST Design: Double-Delta Is Checking Out in Wind-Tunnel Tests	Trends	4/15	12	(0.7)
Hardware Is Ready: Surveyor Prepares for the Moon	Trends	4/15	22	(1.0)

Critical Tests Will Decide the Future for Inflatable Space Structures

Progress Is Reviewed on the Fixed-Wing Supersonic Transport

Molab Life Support Systems Pass First Tests in a Mockup

For '66: R & D Spending To Be Up Slightly

Trends	4/29	12	(0.5)
Trends	4/29	14	(0.6)
Trends	4/29	22	(0.7)
Trends	12/23	6	(0.5)

78. Environmental Design

Corrosion Resistance	Groves	4/1	119	(5.0)
Off-the-Shelf Oceanography	Barnes	8/5	114	(6.0)
Lunar Landing Research Vehicle	Barnes	11/25	146	(5.0)
Crackups and Cartoons Help Solve Lunar-Landing Problems	Trends	4/1	12	(0.7)
Hazards Are About As Predicted	Trends	5/13	22	(1.5)
Particles and Plasma Pommel the Packages	Trends	5/13	24	(0.5)
Moon-Machine Instruments Will Be Tested Aboard Earth Lab	Trends	5/27	12	(0.6)
Picking Up the Pace on Apollo	Trends	5/27	22	(1.5)
Mariner Success Seems Assured for July 14	Trends	7/8	12	(1.0)
Gemini 5 Orbit Time Will Match One Apollo Trip	Trends	8/5	10	(0.5)
Inflatable Still Desalts Ocean Water ..	Trends	9/16	10	(0.5)
Satellites Hint Meteoroids Aren't Too Dangerous	Trends	9/16	12	(0.5)
Deepstar-4000 Makes Ready for Dives to Design Depth	Trends	9/30	12	(1.0)
Dam Divers Defeat Decompression Dilemma	Trends	11/25	14	(1.3)
Spacecraft Testers Will Work in a Vacuum	Trends	12/9	10	(0.7)
Alumnaut Sets a Diving Record	Trends	12/9	14	(0.6)
Sea Sarong: A New Look in Wet-Suit Design	Trends	12/23	6	(0.5)
Foam-Filled Solar Mirror Inflates in Space	DIA	9/16	30	(1.0)

Engineering Management, Personal

81-84. Engineering Department Operations

The Dispensable Engineers	Bard	2/18	158	(2.0)
Selecting the Right Research Project ..	Suits	4/1	90	(3.0)
Project Scheduling—The Second Generation	O'Brien	4/29	172	(10.0)
Follow-up Techniques for Successful Delegation	Burgess	4/29	183	(3.0)
Engineering Proposals	Morris	5/13	164	(5.0)
New Graphic Symbols for Fluid-Power Circuits	Long	5/13	211	(5.0)
Engineering Impact	Rader	5/27	113	(3.0)
Someone Has To Do the Work!	Lloyd	6/10	143	(1.0)
Creative Disorganization	Bard	6/24	130	(2.0)
Engineering Manpower Audit	Runyon	7/8	102	(8.0)
Programmed Instruction for Engineers—Part 1	Gould	7/22	122	(6.0)
What is a "Test"?	Young	7/22	129	(3.0)
Programmed Instruction for Engineers—Part 2	Gould	8/5	108	(4.0)
Evaluate Your Engineers	Marvin	11/11	168	(4.0)
The Search for Supervisors	Hoffman	11/25	132	(5.0)
Profit Improvement Program for Design Engineering	Poyser	12/23	88	(6.0)
Engineering Supervision—2: What Supervisors Do	(Article)	12/23	94	(3.0)
Engineers Needed, 1973	Trends	1/7	108	(0.5)
Survey Shows Increase in Engineering Salaries	Trends	3/18	150	(0.8)
Drafting by Computer	Trends	6/10	12	(0.7)
'Lab Road' Creates Hills for Full-Size Truck Testing	Trends	7/22	14	(0.6)
DoD Personnel Ask Questions First, Research Later	Trends	9/16	152	(0.6)
Role of Engineers in Management Is Discussed	Trends	10/14	178	(0.6)
Flexible Platen Marks on Curve	Scan	8/5	127	(0.5)
Desk-Top Copier Makes Reproductions of Any Length	DIA	2/4	26	(1.0)
Plotting Table Makes Program Tape ..	DIA	2/18	30	(0.5)
Tripod Compass Draws Error-Free Ellipses	DIA	3/4	28	(0.5)
Drawing Blade Goes in Circles	DIA	9/16	42	(0.5)
T-Shaped Tracer Eases Pipe-Drawing Chores	DIA	9/30	35	(0.5)

85-86. Technical Information, Patents

Indexing vs Classification	Lancaster	1/7	105	(3.0)
Tonic for Technical Talks	Ebel	1/21	136	(4.0)
Patent Right and Rewards	(Article)	2/4	94	(5.0)
Problems with Patents	(Article)	2/18	152	(5.0)
Fluid Power Graphic Symbols	Long	2/18	199	(6.0)
Should the U. S. Stamp Out Patents?	(Article)	3/4	111	(3.0)

Fluid-Power Standards	Pippenger	5/13	197	(4.0)
Plan Ahead for Publication	Olson	10/28	126	(5.0)
Classifying Information	Taulbee	12/9	191	(3.5)
Images Appear from Microfilm Wand ..	DIA	12/23	26	(1.0)

87. Personal and Professional

Ivorytowerism	(Articles)	1/7	102	(3.0)
In-Plant Engineering Refresher Course	Ziemke	1/21	142	(4.0)
The Great Debate: Which Way Engineering Education	(Article)	3/4	102	(1.0)
The Great Debate: An Industrialist's Viewpoint	Rader	3/4	103	(2.0)
The Great Debate: An Educator's Viewpoint	Davidson	3/4	105	(3.0)
The Great Debate: A Space Engineer's Viewpoint	Purser	3/4	108	(2.5)
European Engineer	Williams	3/18	138	(12.0)
Stimulating Invention	(Article)	4/1	86	(4.0)
Learn to Play Your Hunches	Raudsepp	4/15	132	(6.0)
A Consulting Career	Campbell	4/15	139	(3.0)
Money Can Compromise Creativity	Macklin	5/13	169	(2.0)
Testing for Creativity—Part 1: Cognitive Problem-Solving Tests	Raudsepp	5/27	106	(7.0)
Testing for Creativity—Part 2: Perception-Personality Tests	Raudsepp	6/10	136	(6.0)
Testing for Creativity—Part 3: Personality Tests	Raudsepp	6/24	122	(7.0)
Management Clinic: Protecting Trade Secrets	Marvin	7/8	112	(2.0)
State of the Unions—Part 1: Engineers' Attitudes toward Unions	(Article)	8/19	140	(5.0)
State of the Unions — Part 2: How Unions Affect Engineers	(Article)	9/2	102	(3.0)
Management Clinic: Let Go of Technical Details	Schrenk	9/2	105	(2.0)
Designing a Resume That Sells	Andrews	9/16	146	(4.0)
Engineers Appraise Societies	(Article)	9/16	150	(2.0)
Engineering-Technician Certification ..	Peterson	9/30	88	(4.0)
It's Better to Work for Yourself	Gernhardt	9/30	92	(1.0)
Conformity and the Engineer—Part 1 ..	Raudsepp	10/14	172	(6.0)
Management Clinic: Prospects for Engineers in Top Management	Rader	10/14	179	(2.0)
Conformity and the Engineer—Part 2: Constructive Nonconformity	Raudsepp	10/28	122	(4.0)
The Engineer in Research	Raudsepp	11/11	172	(4.0)
Improve Your Image	Dunn	11/25	138	(4.0)
Engineering Supervision—3: Supervisors Rate Their Engineers	(Article)	12/9	134	(4.0)
Technical-Manpower Market Looks Good Through 1970	Trends	11/11	176	(0.5)
High-School Image of Engineering Is Fuzzy	Trends	12/9	138	(0.7)
Conferees Discuss Problems of the Professional Engineer in Industry	Trends	12/23	97	(1.0)

Specific Machines and Equipment

911. Ordnance, Missiles

Shells Into Orbit	Article	1/7	115	(3.0)
A Case for Solid Rockets	Article	10/28	132	(4.0)
Single-Barrel Missile Launcher Shoots ASROCs or Terriers	Trends	6/24	14	(0.5)
Fly-by-Wire Missile Scores Bulls-Eyes on Tanks	Trends	9/30	10	(0.5)
Sub-Hunting Torpedo Joins the Fleet	Trends	11/11	10	(0.5)
Clip-Loaded Cannon Served by Built-In Crane	DIA	6/24	25	(1.0)

912. Machinery

Whirling Discs Separate, Three-Component Mixture	Scan	6/24	142	(0.5)
Flexible Strip Grips Regardless of Ball Size	Scan	8/19	160	(0.5)
Demonstrator Shows Earth Orbits	DIA	1/21	26	(0.5)
Fail-Safe Carrier Puts Bite on Coil	DIA	2/4	22	(1.0)
Beach Sweeper Cleans Up After Litter Bugs	DIA	2/18	30	(0.5)
Programmed Sack Stacker Loads Delivery Trucks	DIA	3/4	22	(2.0)
No Strings on Sea-Bottom Sampler	DIA	4/1	26	(1.0)
Steel Strapper Turns Out Tight Coils	DIA	4/15	39	(1.0)
Straight Sweeping Blade Clears Wheelhouse Windshield	DIA	4/15	45	(0.5)
Washing Machine Gives Substrates Dozen Dunkings	DIA	4/29	26	(2.0)
High Speed Roller Deburrs Flat Metal Parts	DIA	6/10	34	(0.5)
Ice-Cubes Form in Freezer Conveyor Belt	DIA	6/24	27	(1.0)
Soil Tester Pushes Itself into the Ground	DIA	7/22	30	(1.0)
X-Ray Sensor Sorts Spuds from Stones	DIA	7/22	32	(0.5)
Self-Propelled Conveyor Scoops Cargo on Powered Rollers	DIA	9/2	34	(1.0)
Excavator Digs and Rolls Under Hydraulic Power	DIA	9/16	26	(2.0)
Tea Is Served by Not-So-Dumb Waiter	DIA	9/16	39	(0.5)
Crane Mounted Conveyors Carry Crumbly-Free Coke	DIA	9/16	42	(0.5)
Hollow-Cathode Furnace Melts with Argon-Plasma Beam	DIA	9/30	28	(1.0)
Supplies Ride Ship-to-Ship Trolley	DIA	10/14	24	(2.0)
Controlled-Drop Air Lance Cleans Boiler's Tubes	DIA	11/11	30	(1.0)
Sand Stream from Paddle Wheel Smothers Forest Fires	DIA	11/25	22	(2.0)
Crane Tower Grows from Top Down	DIA	11/25	32	(0.5)
Foot Power Moves Wall-Climbing Bicycle	DIA	12/9	36	(0.5)

913. Electrical Machinery

Carrier's Landing System Lines Up Aircraft 20 Miles Out	Trends	4/29	14	(0.7)
LP-Disc Adds Pictures to the Music	Trends	5/27	14	(0.8)
Instrument-Panel Tape Recorder Backs Up Pilot's Memory	DIA	3/4	26	(1.0)
Sun-Pressure Vanes Stabilize Spacecraft Plasma Jet Forms Revolving-Oven Cathode	DIA	3/18	22	(2.0)
Darting Arms Play Data From Discs	DIA	4/29	30	(1.0)
Bounced Infrared Beam Triggers Fog Horn	DIA	5/13	36	(1.0)
Phone Meter Shows Unused Talk Money	DIA	7/22	32	(0.5)
Cordless Console Handles Phone Calls Faster	DIA	9/30	35	(0.5)
Skid-and-Go Disc Plays Instantaneously	DIA	10/28	22	(2.0)
	DIA	12/23	22	(2.0)

914. Automotive, Rail, Marine

Back-Country Sportsters	Barnes	4/15	142	(8.0)
For Manipulating Mammoths				
Merged Modules	Barnes	1/21	146	(2.0)
Highway Heavyweights	Victors	1/21	148	(4.0)
Designer for Indianapolis	Wood	5/13	174	(8.0)
Ferrari and Others Race at Le Mans	Wise	7/22	132	(6.0)
Design for the Backwater	Baranson	9/2	108	(8.0)
The Similar '66s	Wise	9/30	94	(12.0)
Turbo Titan III	(Article)	8/19	147	(4.0)
Goldenrod Goes for a Record	(Article)	9/16	162	(2.0)
Deep-Water Driller	(Article)	10/28	136	(2.0)
RR Model Change	(Article)	12/9	140	(6.0)
Commercial Deep-Water Hydrofoil Challenges Passenger Aircraft	Trends	8/5	14	(0.5)
Bronco Heads for the Hills	Trends	8/19	12	(1.0)
Power Windows Block Out Noise	Trends	8/19	171	(0.5)
ACVs Try Shuttling Passengers between Bay-Area Airports	Trends	9/2	12	(1.0)
Fastest-Working Vehicles Would Accept Daily Beatings	Trends	10/28	14	(1.0)
150-mph Ferry Proposed as 'Turnpike' of the Future	Trends	11/11	10	(0.5)
Automatic Plow Feels for Furrows	DIA	1/7	26	(1.0)
Air Supports Jet Propelled Bubble Boat	DIA	1/7	30	(0.6)
Carriage Pulls Engineless Railcar	DIA	1/21	26	(0.5)
Diesel Truck Takes 3-Ton Load	DIA	3/18	28	(1.0)
Window-Blind Hatch Cover Speeds Bulk-Cargo Handling	DIA	3/18	32	(0.5)

French Sedan Doubles as Station Wagon	DIA	4/1	22	(2.0)
Cargo-Truck Deck Rocks and Rolls to Match Aircraft Door	DIA	4/29	28	(1.0)
Climbing Barges Bypass Locks	DIA	5/13	30	(0.5)
Rocking Foot Kicks Freight Car Along the Rails	DIA	4/29	34	(1.0)
Swing Out Decks Build Military Bridges	DIA	5/27	26	(2.0)
New Bus Series Offers Street or Highway Designs	DIA	5/27	30	(1.0)
Mechanical Pony Prances While Driver Plods Behind	DIA	7/22	24	(1.0)
Turning Seat in Swinging Cab Improves Driver's View	DIA	7/22	28	(1.0)
Cargo Van Rides on Gimballed Trailer Frame	DIA	8/5	26	(1.0)
Truck-Body Scale Guarantees Square Meal for Cows	DIA	9/2	37	(0.5)
Squirt-Powered Cart Spots Freight Cars	DIA	9/16	36	(0.5)
Weight-Saving Design Boosts Car Payload	DIA	9/30	30	(1.0)
Radio-Controlled Plow Plants Drainage Pipe	DIA	10/14	42	(0.6)
French Truck Negotiates Tight Corners	DIA	10/14	28	(1.0)
Molten Metal Shuttled in Thermos-Bottle Car	DIA	11/25	32	(0.5)

914. Aircraft, Space Vehicles

Helicopters: Lethal Eagles or Sitting Ducks	Barnes	7/8	114	(6.0)
Shadowy YF-12A Will Go to SAC	(Article)	9/16	160	(2.0)
C-5A: Lockheed's Fleet in One	(Article)	11/11	178	(8.0)
Emmet Revival	(Article)	12/23	98	(4.0)
Twin-Engine Business Planes Introduced	Trends	3/4	10	(0.7)
Size and Efficiency are Increased for DC-8s	Trends	4/29	12	(0.5)
Jet-Controlling Gyro Promises to Save Spacecraft's Fuel	Trends	5/27	10	(0.5)
Lean Teams Develops Wingless Glider	Trends	7/8	14	(0.6)
Second XB-70A Takes to the Air	Trends	8/5	10	(0.5)
OAQ Prototype Proves Durable During Ground Testing	Trends	9/16	12	(0.5)
Second Lifting Body Passes the Half-Built Mark	Trends	10/14	14	(0.6)
Fold-Rotor Aircraft Would Fly 500 mph	Trends	10/28	10	(0.6)

915. Instruments

Closed-Circuit Television from Mars	(Article)	8/19	150	(2.0)
Scanning Microscope Produces Photograph-Like Image	Trends	6/24	10	(0.6)
Outstanding Designs Are Honored at Trade Fair	Trends	11/11	14	(1.3)
Tapered Pin Measures Holes	Scan	4/15	161	(0.6)
Flopped Light Beam Measures Strip	Scan	5/27	141	(1.0)
Flexing Shutter Measures Pressure	Scan	5/27	140	(0.5)
Variable-Density Filters Insure Correct Exposure	Scan	6/24	144	(0.5)
Vibrating "Finger Nail" Indicates Surface Roughness	Scan	12/9	155	(1.0)
Explosive-Shutter Camera Captures Split-Second Explosion	DIA	4/1	29	(1.0)
Skuffing Pendulum Tests Road's Skid Resistance	DIA	5/13	30	(0.5)
Electrode Reaction Tells Water's Oxygen Content	DIA	5/13	34	(1.0)
Three-Eyepiece Microscope "Digitizes" 0.0001-in. Motion	DIA	5/27	33	(1.0)
Radioactive Anemometer Measures Tiny Air Gusts	DIA	5/27	41	(0.5)
Airborne Camera Horizon to Horizon	DIA	7/8	22	(2.0)
Varying Stylus Speed is Key to Torpedo Test Accuracy	DIA	7/22	22	(2.0)
Lens System Projects Color Motion Pictures	DIA	8/5	22	(2.0)
Twenty-Dollar Polaroid Says Yes When Light is Right	DIA	8/19	22	(2.0)
Touch of a Finger Adds Balance Weights to Scale	DIA	8/19	36	(0.6)
Fan-Mounted Lenses Vary Film Image Magnification	DIA	9/2	26	(2.0)
Tape-Measure Transmitter Signals Web Width Error	DIA	9/16	32	(1.0)
Dial Looks for Bend in the Rod	DIA	9/16	34	(0.5)
Drum Head Senses Earthquake Sounds	DIA	9/16	36	(0.5)
Magnetic Pick Up Coddles Projector Slides	DIA	10/14	32	(1.0)
Detectors Keep Ultrasonic Fingers on Traffic Pulse	DIA	10/14	37	(1.0)
Microwave Interferometer Measures the Untouchables	DIA	10/28	26	(1.0)
Roving Probe Picks Off Selected Light Values	DIA	10/28	28	(1.0)
Self-Monitoring Strobe Emits Just Enough Light	DIA	10/28	30	(1.0)
Panoramic Camera Exposes Tubing Defects	DIA	11/11	28	(1.0)
Trace-Gas Density Tells Storage-Tank Content	DIA	11/11	32	(1.0)
Pulsing Bed Pad Keeps Patients Comfortable	DIA	11/25	26	(0.5)
Float-Driven Recorder Marks Tide Changes	DIA	11/25	29	(1.0)
Wire-Hung Mirror Improves Astrolabe Accuracy	DIA	12/9	32	(1.0)
Radioactive Probe Does On-the-Spot Soil Evaluation	DIA	12/9	34	(1.0)
Thermometer Senses Below 20 K	DIA	12/9	36	(0.5)